

CLAIMS

- [001] 1. A device for regulating the armature stroke in a reversible linear drive unit comprising at least one excitation coil to be acted upon by an excitation-coil current and a magnetic armature which is to be set in linear oscillating motion in an axial direction with a predefined armature stroke by a magnetic field of the excitation coil, comprising means for detecting the actual armature position (x), means for measuring the actual excitation coil current ( $I_{act}$ ) and means for adjusting the excitation coil current ( $I_{des}$ ) such that during each half-wave of the armature motion in the steady state of the armature (8), the armature is supplied with precisely the amount of energy such that the oscillation amplitudes ( $+L_1$ ,  $-L_2$ ) of the predefined armature stroke (H) are reached.
- [002] The device according to claim 1, characterised in that the armature (8) is held by means of at least one spring element (9, 9') so that it can oscillate.
- [003] The device according to claim 1 or claim 2, characterised in that the current adjusting means as a control element of the current regulation can comprise a rectifier circuit (G) and a following bridge circuit (B) provided with adjustable bridge cross-links (b1 to b4) in a so-called H-arrangement.
- [004] The device according to claim 3, characterised in that the adjustable bridge cross-links (b1 to b4) are MOSFETS.
- [005] The device according to claim 3 or claim 4, characterised in that the measured excitation coil current is advantageously supplied as an actual current input quantity ( $I_{act}$ ) to a current regulating module (11) associated with the bridge cross-links (b1 to b4), which switches the bridge cross-links such that the actual current signal ( $I_{act}$ ) is tuned to a desired current signal ( $I_{des}$ ) generated by a position regulator module (10, 10') and correlated with the actual armature position (x), preferably following said signal.

- [006] The device according to claim 5, characterised in that the actual current signal ( $I_{act}$ ) should be supplied to the position regulator module (10').
- [007] The device according to any one of the preceding claims, characterised in that means for continuously detecting the direction of motion of the armature (8) are provided.
- [008] The device according to any one of the preceding claims, characterised in that means for continuously detecting the speed of the armature (8) are provided.
- [009] The device according to any one of claims 1 to 8, characterised in that a trigger position for a speed measurement is provided at least at one fixed position within the armature travel.
- [010] The device according to claim 9, characterised in that the trigger position is provided in the area of the maximum speed of the armature (8).
- [011] The device according to any one of claims 8, 9 or 10, characterised in that means for deriving the energy stored in the armature from the speed determination are provided.
- [012] The device according to any one of the preceding claims, characterised in that means for regulating the oscillation frequency of the armature (8) are provided.
- [013] The device according to any one of the preceding claims, characterised in that the armature (8) is rigidly connected to a pump piston of a compressor (V).